Exelon Generation

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10 CFR 50.73

RA17-032

March 30, 2017

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555-0001

LaSalle County Station, Unit 2
Renewed Facility Operating License No. NPF-18
NRC Docket No. 50-374

Subject: Licensee Event Report 2017-002-00, High Pressure Core Spray System Declared Inoperable due to Cooling Water Strainer Backwash Valve Stem-Disc Separation

In accordance with 10 CFR 50.73(a)(2)(v)(D), Exelon Generation Company, LLC (EGC) is submitting Licensee Event Report (LER) Number 2017-002-00 for LaSalle County Station, Unit 2.

There are no regulatory commitments in this letter. Should you have any questions concerning this report, please contact Mr. Guy V. Ford, Jr., Regulatory Assurance Manager, at (815) 415-2800.

Respectfully,

Harold T. Vinyard
Plant Manager
LaSalle County Station

Enclosure: Licensee Event Report

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – LaSalle County Station

NRC FORM 366 (06-2016) U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

(See Page 2 for required number of digits/characters for each block)

(See NUREG-1022, R.3 for instruction and guidance for completing this form http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr1022/r3/)

1. FACILITY NAME	2. DOCKET NUMBER	3. PAGE
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4. TITLE

High Pressure Core Spray System Declared Inoperable due to Cooling Water Strainer Backwash Valve Stem-Disc Separation

5. EVENT DATE			6. LER NUMBER			7. REPORT DATE			8. OTHER FACILITIES INVOLVED	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO.	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
									NA	NA
01	30	2017	2017	- 002 -	00	03	31	2017	NA	NA

9. OPERATING MODE	11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check all that apply)*			
1	☐ 20.2201(b)	☐ 20.2203(a)(3)(i)	☐ 50.73(a)(2)(ii)(A)	☐ 50.73(a)(2)(viii)(A)
	☐ 20.2201(d)	☐ 20.2203(a)(3)(ii)	☐ 50.73(a)(2)(ii)(B)	☐ 50.73(a)(2)(viii)(B)
	☐ 20.2203(a)(1)	☐ 20.2203(a)(4)	☐ 50.73(a)(2)(iii)	☐ 50.73(a)(2)(ix)(A)
	☐ 20.2203(a)(2)(i)	☐ 50.36(c)(1)(i)(A)	☐ 50.73(a)(2)(iv)(A)	☐ 50.73(a)(2)(x)
10. POWER LEVEL	☐ 20.2203(a)(2)(ii)	☐ 50.36(c)(1)(ii)(A)	☐ 50.73(a)(2)(v)(A)	☐ 73.71(a)(4)
	☐ 20.2203(a)(2)(iii)	☐ 50.36(c)(2)	☐ 50.73(a)(2)(v)(B)	☐ 73.71(a)(5)
	☐ 20.2203(a)(2)(iv)	☐ 50.46(a)(3)(ii)	☐ 50.73(a)(2)(v)(C)	☐ 73.77(a)(1)
98	☐ 20.2203(a)(2)(v)	☐ 50.73(a)(2)(i)(A)	☒ 50.73(a)(2)(v)(D)	☐ 73.77(a)(2)(i)
	☐ 20.2203(a)(2)(vi)	☐ 50.73(a)(2)(i)(B)	☐ 50.73(a)(2)(vii)	☐ 73.77(a)(2)(ii)
		☐ 50.73(a)(2)(i)(C)	☐ OTHER Specify in Abstract below or in NRC Form 366A	

12. LICENSEE CONTACT FOR THIS LER

LICENSEE CONTACT	TELEPHONE NUMBER *(Include Area Code)*
Joe Fiesel, Maintenance Director	(815) 415-2500

13. COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT

CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX	CAUSE	SYSTEM	COMPONENT	MANU-FACTURER	REPORTABLE TO EPIX
B	BG	V	A391	Y	NA	NA	NA	NA	NA

14. SUPPLEMENTAL REPORT EXPECTED	15. EXPECTED SUBMISSION DATE	MONTH	DAY	YEAR
☐ YES *(If yes, complete 15. EXPECTED SUBMISSION DATE)* ☒ NO		NA	NA	NA

ABSTRACT *(Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)*

On January 30, 2017, during routine surveillance testing of the Unit 2 Division 3 Diesel Generator Cooling Water (DGCW) system, the cooling water strainer backwash valve was unable to open. The Division 3 DGCW system was declared inoperable. Upon investigation, operators determined the cause of the valve malfunction was due to stem-disc separation. Division 3 DGCW is a support system for the Division 3 Emergency Diesel Generator and the High Pressure Core Spray (HPCS) system. The required actions of Technical Specifications (TS) 3.7.2 and 3.5.1 were entered on January 30, 2017 when the DGCW and HPCS system, respectively, were determined to be inoperable. TS 3.7.2 Required Action (RA) A.1 requires the supported system to be immediately declared inoperable. TS 3.5.1 RA B.2 requires restoration of the HPCS system to operable within 14 days. TS 3.8.1 was not applicable since a note provides that Division 3 AC electrical power sources are not required to be operable when HPCS is inoperable. The valve was replaced, and the HPCS system was returned to operable on February 2, 2017.

This condition could have prevented the HPCS system, a single train safety system, from performing its design function. This event is reportable in accordance with 10 CFR 50.73(a)(2)(v)(D) as an event or condition that could have prevented fulfillment of the safety function of structures or system that are needed to mitigate the consequences of an accident. There were minimal safety consequences associated with the event since the other emergency safety systems remained operable, and the Division 3 DGCW system remained functional as it retained the ability to provide the required flow through the system. The apparent cause of the stem-disc separation was erosion due to the carbon-steel valve internals in a raw water system environment.

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NARRATIVE

PLANT AND SYSTEM IDENTIFICATION

LaSalle County Station Unit 2 is a General Electric Boiling Water Reactor with 3546 Megawatts Thermal Rated Core Power.

The affected system was the Division 3 Diesel Generator Cooling Water (DGCW) system, which is a support system for the High Pressure Core Spray (HPCS) system and associated Division 3 Emergency Diesel Generator.

CONDITION PRIOR TO EVENT

Unit(s): 2	Event Date: January 30, 2017	Event Time: 1908 CST
Reactor Mode(s): 1	Mode(s) Name: Power Operation	Power Level: 98 percent

DESCRIPTION OF EVENT

On January 30, 2017, during monthly operability surveillance testing of the Unit 2 Division 3 DGCW system, the cooling water strainer backwash valve 2E22-F319 was unable to open when the strainer control switch was selected and during subsequent manual operation of the valve. The valve was eventually able to be closed; however, no flow was detected during the manual backwash operation. The Division 3 DGCW system was declared inoperable. Upon investigation, operators determined the cause of the valve malfunction was due to stem-disc separation.

The Division 3 DGCW system is a support system for the HPCS system and the associated Division 3 Emergency Diesel Generator. The required actions of Technical Specifications (TS) 3.7.2 were entered on January 30, 2017 at 1908 CST when the 2B DGCW system was declared inoperable. Required Action (RA) A.1 was immediately completed to declare the supported HPCS system inoperable. TS 3.5.1 RA B.1 to administratively verify the Reactor Core Isolation Cooling (RCIC) system operability was completed immediately, and RA B.2 was entered to restore HPCS to operable status within 14 days. TS 3.8.1 was not applicable since a note provides that Division 3 AC electrical power sources are not required to be operable when HPCS is inoperable. An Emergency Notification System (ENS) report 52519 was made on January 30, 2017 in accordance with 10 CFR 50.72(b)(3)(v)(D), for an event or condition that could have prevented fulfillment of the safety function of structures or system that are needed to mitigated the consequences of an accident.

CAUSE OF EVENT

The Division 3 DGCW strainer backwash valve 2E22-F319 was unable to open due to stem-disc separation within the valve body. The apparent cause of the stem-disc separation was erosion due to the carbon-steel valve internals in a raw water system environment. The use of carbon steel valves and components in raw water systems led to the valve component's accelerated corrosion and pitting.

Contributing causes include extension of preventative maintenance (PM) to replace the valve beyond the life of valve 2E22-F319, and T-gap measurement used to determine valve health requires optimization. The use of carbon steel valves in raw water systems was first evaluated in 1996 as an operational vulnerability at LaSalle Station. The valve failed prior to its scheduled replacement in November 2017.

REPORTABILITY AND SAFETY ANALYSIS

This event is reportable in accordance with 10 CFR 50.73(a)(2)(v)(D) as an event or condition that could have prevented fulfillment of the safety function of structures or system that are needed to mitigate the consequences of an accident. This condition could have prevented the HPCS system, a single train safety system, from performing its design function, to provide cooling to the required equipment, which rendered the cooling water system inoperable in accordance with TS 3.7.2, Diesel Generator Cooling Water (DGCW) System.

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There were minimal safety consequences associated with the event since other emergency safety systems remained operable, including emergency core cooling system (ECCS) systems for Division 1 and Division 2 and their associated emergency diesel generators. The DGCW system remained functional as the system retained the ability to provide the required flow through the system. However, this event was considered a safety system functional failure, as defined in accordance with NEI 99-02, Regulatory Assessment Performance Indicator Guideline.

CORRECTIVE ACTIONS

The station performed troubleshooting to identify the initial condition of the valve. The Division 3 DGCW strainer backwash valve 2E22-F319 was cut out and replaced by a new stainless steel type. The degraded valve was sent offsite for component failure diagnostics and analysis. An apparent cause investigation was performed which determined the cause of the valve's stem-disc separation was accelerated corrosion and pitting of the carbon-steel valve internals in a raw water system environment.

An extent of condition review identified two installations of the Anchor Darling valve model # 94-14040. Therefore, the specific extent of condition is the (Unit 1) 1E22-F319 and (Unit 2) 2E22-F319 DGCW Strainer backwash valves. The subject Unit 2 Division 3 DGCW strainer backwash valve 2E22-F319 was replaced with a stainless-steel type on February 1, 2017. The Unit 1 1E22-F319 valve is scheduled to be replaced on November 27, 2017.

The extent of condition applies to the Unit 1 and Unit 2 DGCW and core standby cooling system (CSCS) valves that are exposed to a raw water environment. Some of these valves have been replaced with stainless-steel components, while other valves are scheduled for replacement in future refueling outages.

PREVIOUS OCCURRENCES

A review of LaSalle Station Licensee Event Reports for the past three years, related to stem-disc separation issues or HPCS system issues, identified the following similar instance at LaSalle Station.

LER 373-2015-001:
On December 29, 2014, Unit 2 was in Mode 1 at 100 percent power with a operability test in progress on the 2B DG. During performance of the test, operators noticed a small leak of about one drop per second coming from the casing of the 2B HPCS DGCW pump. The 2B DG and supported HPCS system were declared inoperable. The station entered TS 3.5.1 Required Actions B.1 to verify the RCIC system was operable and B.2 to restore HPCS to operable status within 14 days. Examination of the pump casing determined the apparent cause of the leak was erosion from impeller flow impingement. The pump was replaced and returned to service on January 3, 2015. This event did not involve stem-disc separation in a valve; however, it was related to a failure affecting performance of the HPCS system.

COMPONENT FAILURE DATA

Manufacturer: Anchor Darling (A391)
Device: Gate Valve, 4-inch, Carbon-Steel
Component ID: Model 94-14040